

Pressure Gage and SWICHGAGE®

OPL-96001B
Revised 02-03
Catalog Section 05
(00-02-0029)

FWMurphy

OPL Series

4-1/2 in. (114 mm) Diameter Dial



- Combination Indicating Gage and Critical Pressure Limit Switches
- High and Low Pressure Limit Contacts Are Visible and Adjustable
- Panel and Surface Mount Versions
- Indicating-only MURPHYGAGE® Available
- Latching Control Relay Versions Available



Description

The OPL Series Pressure SWICHGAGE® instruments are combination pressure indicating gages with adjustable low and high limit switches. Limit switches can be wired directly to electric pilot circuits to operate alarms, shutdown or start/stop of engines and electric motors.

Surface mount or panel mount enclosure is available for most versions. All versions feature a 4-1/2 in. (114 mm) dial for easy viewing. Adjustable limit switches are accessible from front of the SWICHGAGE®. Limit contacts have self-cleaning motion to enhance electrical continuity.

Other versions available (see page 2):

- Gage-only without contacts (MURPHYGAGE®)
- SWICHGAGE® with built-in latching relay for start-stop operations.

Specifications

Case: Die cast aluminum; weatherproof.

Contacts: See *Electrical* page 3, for contact ratings.

Dial: 4-1/2 in. (114 mm) white on black, dual scaled psi /kPa. Other dial configurations available. Consult factory.

Gage Accuracy: ±2% for the **first** and **last** quarters of the scale, the **middle** half is ±1%.

Geared Movement: 302 and 304 stainless steel.

Lens: Optically clear polycarbonate.

Pointer: High visibility with a pointer calibration hub.

Process Connection: Available in 1/4 NPT and 1/2 NPT. See **Table B**, page 5.

Sensing Element: Select from bronze or 316 stainless steel bourdon tube. See **Table B**, page 5 for bourdon tube/socket combinations.



Product Selection Information

WARNING: Selection of the proper gage/SWICHGAGE® should include consideration for the service application, the medium being measured, electrical ratings, hazardous area requirements and general operating conditions. Improper selection and/or application may be detrimental to the gage/SWICHGAGE®, could cause failure in the operating system and possibly personal injury or property damage. If in doubt consult our sales/engineering staff.

Warranty

A two-year limited warranty on materials and workmanship is provided with this Murphy product. Details are available on request and are packed with each unit.

*Selected configurations are third party listed. Consult factory for details.

**Products covered by this bulletin comply with EMC Council directive 89/336/EEC regarding electromagnetic compatibility as noted.

Base Models



OPLC, OPLCE and OPLG

The **OPLC** is a surface mounting, indicating, pressure gage and switch. Adjustable high and low limit, ungrounded contacts are used to operate alarm, shutdown or start-stop circuits. Pointer closure against either of the adjustable contacts completes the pilot-duty circuit. An SPST toggle switch is provided to override the low limit contact for equipment startup. Suitable for engines or electric motors with appropriate Murphy magnetic switch or transformer relay assembly.

The **OPLCE** features a panel mount square case. It has all the features of the OPLC except the low limit contact lockout.

The **OPLG** is an indicating-only pressure MURPHYGAGE®. Same as the OPLC except without switch (limit) contacts.



OPLFC and OPLFG

The **OPLFC** is a panel mounting version of the OPLC. It has all of the features of the OPLC except the low limit contact lockout. The lockout must be done externally through the control circuit or with the optional “SA” lockout. The OPLFC is typically used in control panels such as for compressors, pumps, etc. This version can be environmentally sealed with either the “ES” or “OS” options. Contact lead termination is by pigtail wires.

The **OPLFG** is an indicating-only pressure MURPHYGAGE®. Same as the OPLFC except without switch (limit) contacts.



OPLBP and OPLBPE

The **OPLBP** is a specialized version of the OPL series designed for start-stop operation of engines and electric motors. The pilot-duty limit switches are connected to an internal latching control relay for ON/OFF automation. Available for various voltages.

The **OPLBPE** is the same as the OPLBP except has a panel mount square case.



*Selected configurations are third party listed. Consult factory for details.

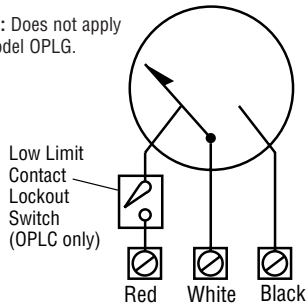
**Products covered by this bulletin comply with EMC Council directive 89/336/EEC regarding electromagnetic compatibility as noted.

Electrical

Dimensions

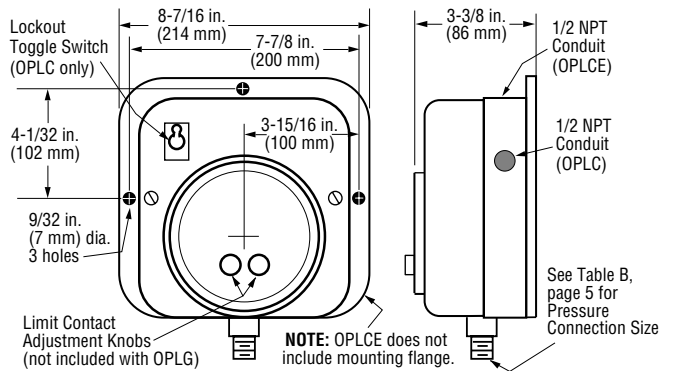
OPLC and OPLCE

NOTE: Does not apply to model OPLG.



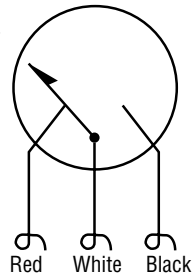
Contact Rating: 1 SPDT; Center off; 2 A, 30 VDC, 1 A, 125 VAC pilot duty

OPLC, OPLCE and OPLG



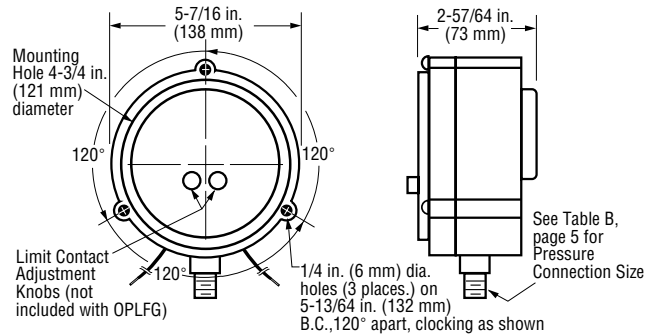
OPLFC

NOTE: Does not apply to model OPLFG.

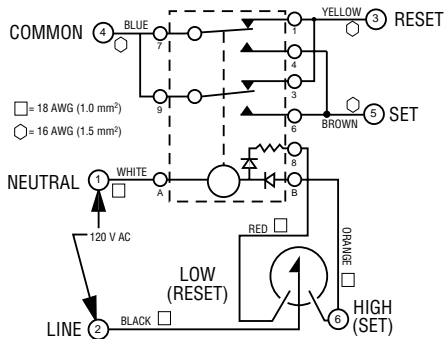


Contact Rating: 1 SPDT; Center off; 2 A, 30 VDC, 1 A, 125 VAC pilot duty

OPLFC and OPLFG

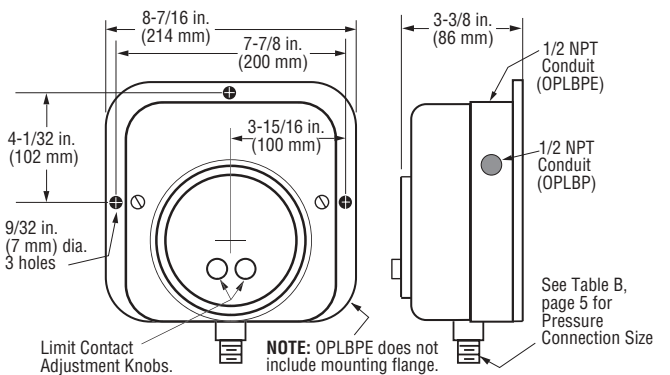


OPLBP and OPLBPE



Contact Rating: SPDT dry relay contacts; 10 A, 125 VAC.

OPLBP and OPLBPE



Options and Accessories

P4 and P6 Options

The **P4** (was *PT147*) option provides a remote seal mechanism to protect the SWICHGAGE® sensing element from line pressures of highly viscous and mildly corrosive fluids. A sealed stainless steel capillary tube, with stainless steel armor, transmits the pressure from the diaphragm seal to the SWICHGAGE®. Standard capillary length is 5 ft. (1.5 m). Optional lengths to 50 ft. (15 m) in 5 ft. (1.5 m) increments are available. Oil well lead lines and pumps with highly viscous liquids are typical applications. A 1 NPT steel plated pulsation dampener is included.

The **P6** (was *PT167*) option is a diaphragm sealed to a 2 NPT housing which attaches directly to the pressure gage connection. The gage sensing element and the diaphragm chamber are filled with a silicone fluid so that pressure against the diaphragm causes the gage to respond. The diaphragm housing is plated machined steel. Typical application is for oil well lead lines. Optional* 304 stainless steel. Ranges 100 to 5,000 psi (689 kPa to 34.5 MPa) [6.9 to 344.7 bar].

The P4 and P6 can be ordered as optional features to the SWICHGAGE® or indicating-only MURPHYGAGE®. See *How to Order* on pages 5 and 6.

*Meets NACE standard MR-01-75 for direct exposure to H₂S service.

NOTE: Pressure ranges below 100 psi (689 kPa) [6.9 bar] are subject to error, if ambient temperature varies greatly.

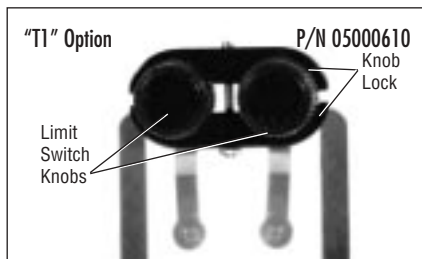


OPLFC-A-600-OS-P6



OPLFC-A-1000-OS-P4

Tamperproof Contact Option



Pulsation Dampener

- Eliminate pointer contact flutter on pressure SWICHGAGE® and MURPHYGAGE® instruments which are subject to pulsating pressure from reciprocating pumps or compressors.
- Allow close high-low contact settings for more accurate pressure indication and equipment control.
- Decrease wear on internal geared movement and increase the life of your instrument by eliminating excessive strain and unnecessary pointer movement.
- Available in brass, carbon steel and stainless steel.
- **Must be ordered separately.** See bulletin PD-95145B.



How to Order

Selecting a Model:

OPLBP - S - 2 - 1000 - T1

1. Select a Base Part Number from **Table A**
2. Select Bourdon Tube and Socket code from **Table B**
3. Select "BP" Relay Voltage code (applies to "BP" models only) from **Table C**
4. Select Range code from **Table D**⁽¹⁾
5. Select Options from **Table E**⁽²⁾

⁽¹⁾ For metric only dials specify scale and unit of measure; example: kPa or bar.

⁽²⁾ List options in alphabetical order (A to Z) followed by numeric in ascending order. Place a dash (-) between each option. See example above.

Table A: Base Models	
OPLC	SWICHGAGE®, surface mount, with low limit lockout switch
OPLCE	SWICHGAGE®, panel mount square case
OPLFC	SWICHGAGE®, panel mount
OPLBP*	SWICHGAGE®, surface mount, with latching control relay
OPLBPE*	SWICHGAGE®, panel mount square case, with latching control relay
OPLG	MURPHYGAGE®, surface mount
OPLFG	MURPHYGAGE®, panel mount
*This version not covered by the CE mark.	

Table C: "BP" Relay Voltage	
Code	Voltage
Blank ⁽³⁾	120 VAC
2	12 VDC
3	24 VAC
4	24 VDC
NOTE: Relay Voltage applies to "BP" models only.	
⁽³⁾ No code is required for 120 VAC voltage.	

Table B: Bourdon Tube and Socket					
Code	Process Connection	Tube Type	Range Selection Limits psi (MPa) [bar]	Bourdon Tube and Tip Material (all joints TIG welded except "A")	Socket Material
A ⁽⁴⁾	1/4 NPT	Drawn C-Tube	Thru 1,000 psi (6.89 MPa) [68.95 bar]	Grade A Phosphor Bronze Tube (Brass Tip, Silver Brazed)	Brass
S ⁽⁵⁾ ⁽⁶⁾	1/4 NPT	Drawn C-Tube	Thru 1,000 psi (6.89 MPa) [700 bar]	316 Stainless Steel	316 Stainless Steel
	1/2 NPT	Drawn Helical	1,500/10,000 psi (10.3/68.9 MPa) [103.42/700 bar]		
⁽⁴⁾ Standard thru 1,000 psi (6.89 MPa) [68.95 bar].					
⁽⁵⁾ Standard 1,500 psi (10.3 MPa) [103.42 bar] thru 10,000 psi (68.9 MPa) [700 bar].					
⁽⁶⁾ Optional all ranges.					

Table D: Ranges

Code	Vacuum/psi	kPa/MPa	bar
30HV60H	30" Hg/Vac-60" Hg/Press.	-101 kPa-203 kPa	-1.01-2.03
30V	30" vac-0 psi	-101 kPa-0 kPa	-1.01-0
30V15	30" vac-15 psi	-101 kPa-103 kPa	-1.01-1.03
30V30	30" vac-30 psi	-101 kPa-207 kPa	-1.01-2.07
30V100	30" vac-100 psi	-101 kPa-689 kPa	-1.01-6.89
30V200	30" vac-200 psi	-101 kPa-1.38 MPa	-1.01-13.79
30V300	30" vac-300 psi	-101 kPa-2.07 MPa	-1.01-20.68
15	0-15 psi	0-103 kPa	0-1.03
30	0-30 psi	0-207 kPa	0-2.06
60	0-60 psi	0-414 kPa	0-4.13
100	0-100 psi	0-689 kPa	0-6.89
160	0-160 psi	0-1.10 MPa	0-11
200	0-200 psi	0-1.38 MPa	0-14
300	0-300 psi	0-2.07 MPa	0-20
400	0-400 psi	0-2.76 MPa	0-28
600	0-600 psi	0-4.14 MPa	0-40
1000	0-1000 psi	0-6.89 MPa	0-70
1500	0-1500 psi	0-10.34 MPa	0-100
2000	0-2000 psi	0-13.79 MPa	0-140
3000	0-3000 psi	0-20.68 MPa	0-200
5000	0-5000 psi	0-34.48 MPa	0-350
10000	0-10,000 psi	0-68.95 MPa	0-700

Dials

All dials are dual scaled psi and kPa/MPa. Single scale dials and custom dials available. Additional charges may apply.

Gages

All 4-1/2 inch (114 mm) SWICHGAGE® devices are available for Class I, Division 1, Groups C & D hazardous applications.

Division 2 locations can also be covered by our Non-Incendive or Intrinsically Safe systems. See the full catalog or contact any Murphy representative for complete details.

Table E: Options[†]

Option	Description	Option	Description
BC	Back connected bourdon tube	P6	(PT167) PT167 pressure transmitter, direct mounting
CC	1/2 NPT conduit connection	P6S	(PT167SS) PT167 pressure transmitter, direct mounting, 304 stainless steel (special order).
ES	Environmentally sealed	T1	(TPC1) Tamperproof, knob locks
EX	Explosion-proof: SWICHGAGE® enclosed within explosion proof case; Class I, Div. 1, Groups C & D	TA	(TCA) Tickler contact
EL	(EXLC) Explosion-proof less case		
LC	Less case		
OS	Oil sealed case		
P4	(PT147) Pressure transmitter with 5 ft. (1.5 m) capillary*		
P4L	PT147 less pulsation dampener* * For capillary greater than 5 ft., specify in 5 ft increments following designator; example: P415		

[†]Options not available on all models or configurations.

Shipping Information****Shipping Weights:**

OPLC: 5 lbs 9 oz (2.5 kg)

OPLG: 5 lbs 6 oz (2.4 kg)

OPLFC and OPLCE: 3 lbs 4 oz (1.5 kg)

OPLFG: 3 lbs 4 oz (1.5 kg)

OPLBP and OPLBPE: 5 lbs 11 oz (2.6 kg)

Shipping Dimensions:

OPLC, OPLG and OPLFG:

9-1/2 x 9-1/4 x 5-3/4 in. (241 x 235 x 146 mm)

OPLFC and OPLCE:

9-1/4 x 8-1/4 x 5-1/2 in. (235 x 210 x 140 mm)

OPLBP and OPLBPE:

9-1/4 x 8-1/4 x 5-1/2 in. (235 x 210 x 140 mm)

** Some options could alter shipping weights and dimensions. Consult factory.